UNITED STATES DEPARTMENT OF ENERGY (DOE)

OFFICE OF FOSSIL ENERGY

CARBON SEQUESTRATION PROGRAM

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

PUBLIC SCOPING MEETING

Taken at Lions Gate Hotel, Grand Ballroom A,

5640 Dudley Boulevard, McClellan Park, California,

Commencing at 7:00 p.m.,

Thursday, May 27, 2004,

Reported by Nicki L. Fukuman, CSR #12492.

ORIGINAL

APPEARANCES:

U.S. DEPARTMENT OF ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY
BY: LLOYD LORENZI
626 Cochrans Mill Road
Pittsburgh, Pennsylvania 15236
(412) 386-6159

U.S. DEPARTMENT OF ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY
BY: SARAH FORBES
3610 Collins Ferry Road
Morgantown, West Virginia 26507
(304) 386-4864

POTOMAC-HUDSON ENGINEERING
BY: FRED CAREY, P.E.
4833 Rugby Avenue, Suite 100
Bethesda, Maryland 20814
(301) 907-9078

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MR. LORENZI: Good evening. The time is now 7 p.m. so let's begin.

This meeting was arranged by the U.S. Department of Energy as one part of an overall effort to obtain public participation in preparing an Environmental Analysis. What we call in the government an Environmental Impact Statement. That analysis will cover the activities and plans by the Department of Energy for implementing a Carbon Sequestration Research and Development Program.

Input from the public will assist the Department of Energy in identifying and prioritizing issues related to carbon sequestration, evaluating the potential impact of sequestration, establishing a frame work for environmental solutions, and overall helping to define a program for future research, development, and testing of technologies and methods for the sequestration of carbon dioxide.

This is the fifth of eight meetings planned at various locations around the country for that purpose. The carbon sequestration activities implemented by the Department of Energy will help achieve the goals of the Global Climate Change Initiative that was announced by the President in 2002.

That initiative will require two things from our efforts. One, it will require the development of technology options and potential to reduce the carbon intensity of the

U.S. economy, and second, it will help establish the information base needed by the year 2012 for effective carbon sequestration decisions that balance economic growth and invest in continuing energy technology in the United States.

The implementation of the Carbon Sequestration Program to achieve those goals decides the primary basis for the Department of Energy's decision to prepare an Environmental Impact Statement. Your comments and input will be an important part of that effort. So I want to thank you you all for your opinions.

My name is Lloyd Lorenzi, and I'm from the Department of Energy Laboratory near Pittsburg, Pennsylvania. We have one other Department of Energy representative that is here tonight, and she will introduce herself.

MS. FORBES: My name is Sarah Forbes, and I'm also with the Department of Energy, same office as Lloyd, but I'm in Morgantown, West Virginia.

MR. LORENZI: Assisting the Department of Energy in preparing the Environmental Impact Statement will be a team of environmental specialists led by Potomac-Hudson Engineering Company, and I would ask the representatives from Potomac-Hudson who are here tonight to introduce themselves.

MR. CAREY: Good evening. My name is Fred Carey. I'm from Potomac-Hudson Engineering, and I have a representative from URS Corporation who is out in the front

lobby. Thank you.

MR. LORENZI: We also have a court reporter here this evening who will prepare a transcript of this meeting, particularly of your comments, which we will use to document and identify views from the public regarding the desired scope and content of the Environmental Analysis that will be prepared.

At the entrance to the meeting room is provided information for you including a description of the process we will use to prepare the Environmental Impact Statement, a description of the current activities and plans by the Department of Energy regarding carbon sequestration, a registration sheet, and so I would encourage you to sign in on the sign-up form as a record of your attendance at the meeting tonight, and we've also provided a comment sheet in which you can submit written comments either tonight or following the meeting. And I want to remind everyone here that the preparation of the Environmental Impact Statement is in the early stages. It really hasn't begun yet wholeheartedly.

We are accepting comments up until June 25th of this year, and those comments will be compiled from all inputs that we get from the eight public meetings as well as any other submitted comments for use in preparing a draft Environmental Impact Statement.

When it's completed, that draft Environmental Impact Statement will be made available for public review and comment, and we will again have a series of meetings around the country to review the public input on that draft EIS.

Before we get to your comments, Sarah Forbes from the Department of Energy will provide a summary of carbon sequestration activities and then the microphone will be yours to provide comments.

Sarah's presentation will provide some useful information I'm sure that you can use in formulating comments, either tonight or following this meeting.

Are there any questions on how the meeting will operate?

No questions.

Sarah.

SARAH FORBES: I'm going to go ahead and stand up. It will help keep me awake. I'm still on East Coast time.

What I'm going to do briefly this evening is to, first of all, describe to those of you -- now, tonight, I'm blessed with an audience who is very familiar with carbon sequestration -- but I'm going to describe what carbon sequestration is, explain a little bit about why the Office of Fossil Energy is interested in carbon sequestration, talk about the different greenhouse gases, different options for stabilizing greenhouse gas emissions, and then I'll get into

some details about the program. And in case I forget later, the document that Fred has pulled up, the Roadmap and Program Plan, that has much greater detail than I'm going to take the time to go through tonight, and I encourage you to look through that as you're preparing your comments.

What is carbon sequestration? Carbon sequestration is the catch and storage of CO2 and other greenhouse gases that would otherwise be released into the atmosphere.

When DOE talks about carbon sequestration, they are talking about capture that occurs both at the point of emissions, that's the stuff that's coming out of the smokestacks, capturing the gas itself or absorbed from the air. Storage locations include underground reservoirs, dissolving into deep oceans, converting CO2 to solid mineral carbonates. Also that the idea -- some of the very early articles about sequestration talk about turning CO2 into useful products and, of course, storing it as carbon in trees, grasses, soils, and algae.

Fossil fuels. A lot of people don't realize that most of our energy today comes from fossil fuels. That's true both in the United States and the rest of the world.

The first time I looked at this pie chart, I was astounded at the similarities between the two. And the world as a whole, you will see slightly less nuclear energy and slightly more hydrogen. They are strikingly similar. We are

very reliant on fossil fuels today.

This year the Energy Administration -- the EIA, the Energy Information Administration, puts out projections. Those latest projections go out to 2025. This is a reference case scenario. This is what they assume as the baseline, and today we use 86 percent of our energy coming from fossil fuels. By 2025, they stay stable at about 87 percent.

One of the things our director always says when she talks, for the forseeable future, we will continue to rely on fossil fuels.

This is a very familiar chart -- probably familiar to most of you. As industrialization has happened, we have seen increased atmospheric concentrations and along with those rising temperatures. The correlation here is very strong.

The Administration is very careful to emphasize that the science is not out on global warming, but nobody debates this chart and the correlation between atmospheric CO2 concentrations and increasing temperatures.

CO2 is the greenhouse gas they are most concerned about, because it's the primary greenhouse gas that is emitted. 81 percent from energy. The other greenhouse gas that we need to look at is methane. Methane is only 9 percent of the man-made emissions, but it has the highest global warming potential. And for any of you that don't

know, that means that methane is actually more potent, but there is also number of new opportunities for capturing and reusing methane. I'm sorry. I'm going to get a drink.

There are also a number opportunities for capturing and reusing methane and a number of new opportunities to make a big cut in methane emissions.

Although, energy is the major contributor towards the greenhouse gas problem, it's not the only one. All sources and all fossil fuels contribute.

Looking at these pie charts, the one on the furthest to your left, transportation, industry. About a third of the greenhouse gas emissions are from transportation, another third from industry, and the final third comes from the residential/commercial sector.

Looking at fossil fuels, it's also split fairly evenly. Oil is about 50 percent and the remainder is that of natural gas and CO2. And again, transportation and electricity are each about a third contributing to the CO2 emissions.

What are we going to do? We have several options for dealing with the climate change issues -- and I apologize I'm stumbling a lot this evening. I'm not sure why. I think I'm fading. We need to do something about the climate change issues. There is several things we need to do. First of all, we need to reduce the carbon intensity of fuel. We can

do that by switching to nuclear energy, and also natural gas is going to emit less CO2.

It's going to be more -- it's going to be more favorable from a climate change perspective. We need to improve energy efficiency both on the demand side and the supply side. And the third option with respect to carbon is the capture and storage from a natural sense.

If we're going to affordably meet the energy demands that are predicted by the EIA in 2025, we're going to need all of these options. One of them can't do it alone.

We have presidential direction supporting the Sequestration Program under this administration. February 14th, Valentine's day, 2002, President Bush spoke publicly about the climate change initiative, which called for an increased look at greenhouse gases over the next 10 years. The plan is in 2012 to evaluate where the science is, look at the options that we have, and make a decision then. The idea is this will allow time to develop technology.

We also have the National Climate Change Technology Initiative, which was initiated in 2001. We have a quote that comes out of that that I really like to read to you, and it was spoken by President Bush in the rose garden: "We all believe technology offers great promise to significantly reduce emissions -- especially carbon capture, storage and sequestration technologies." This administration has been

extremely supportive of our program.

One of the questions I get all the time is, if you capture CO2 emissions from my power plant, how much room is there to store it? And the long answer is, we don't know for sure. We don't have a great idea. On this chart, the dark areas are the fairly certain estimates and the area at the top are shaded to include the potential capacity.

We don't know for sure; however, there are certain formations including a formation that lies underneath the North Sea that estimates say it can store centuries worth of emissions. There is also a formation that underlies the domestic United States that estimates say it will store decades actually worth of emissions.

This actually is an analysis that we've done for the Sequestration Program. It looks at one plausible good scenario for how you can stop greenhouse gas emissions. What we have done here is we have stabilized the greenhouse gas emissions, which is at the 2001 levels out to 2025.

And some people say, how can you get there? Well, from our analysis, it shows about a third of the emissions reductions can be made through simply energy efficiency. It's a very important tool. We could also go a little bit further in forestation and agriculture. Again, a very important step, but it still doesn't get there all the way.

If you want to even stabilize emissions levels at

the 2001 levels, you are going to need something further, and it looks like advanced sequestration, carbon capture, capturing CO2 from our power plants and also what we call value added sequestration. That's using CO2 that you may capture from a power plant or capture from a high period events source or enhanced methane recovery, you can probably make up for the rest of that gap.

It's all good news. It's a very good option, but before we go farther, we really need to make sure that sequestration is, first of all, environmentally acceptable. In dealing with the time constraint issues, we don't want to leave this for future generations. We need to respect the existing ecosystem.

Also, we need to make sure that sequestration is safe. No sudden, large scale releases of CO2. We need to have mitigation technologies. Before we inject CO2 underground, we need to have mitigation technologies and plans designed to prevent any leaks that we detect that may be possible.

We need to verify some simple emissions for accounting purposes. If you're pumping CO2 underground and you don't know how long it stays there, you can't get credit for that. You need to have technologies that can verify it, and we also need technologies that would verify any sequestration of carbon dioxide that would be in storage, and

finally, if this is going to happen, it has to be economically viable.

Sequestration occurs in several parts of DOE. The bottom left is the Office of Fossil Energy. We're the applied folks. The Office of Science is also involved. They are doing the basic science, the basic research in the carbon cycle, and the basic research in the ocean carbon cycle, basic research in the micros that are stored in carbon in the soil. And the Office of Fossil Energy, my office, is taking that next step and getting things through. We are also coordinated above through the Climate Change Technology Program. We offer a lot of coordination.

In the government, the Department of Energy does not do the only sequestration research. Sequestration is something that all types of various -- many title agencies -- and I think it has offered a lot of opportunity for us to work together.

We work with the U.S. Geological Survey on our geologic storage, carbon dioxide storage, and underground formations. Also the Office of Surface Mining on reinforcing abandoned mines and carbon sequestration in those lands. Also NOAA, the National Oceanic and Atmospheric Administration. The USDA particularly wants to be a part of the carbon sequestration. The Department of State has gotten very involved in our Carbon Sequestration Leadership Forum

and other international activities. The National Science Foundation, USAID, EPA, and also NASA.

I'll move on to talk a little more specifically about the DOE's, Department of Energy's, Carbon Sequestration Program structure.

You have three main parts. I mentioned a minute ago the Carbon Sequestration Leadership Forum. That is an international committee coordinated by the Department of State and also the Department of Energy. We have 13 countries that have signed, and it's a mechanism to collaborate research in carbon sequestration among different countries.

The blue circle is our core research and development. That's where we have some numerous research projects going on in the capture of CO2. That is primarily the research in looking at the CO2 that is coming out of our power plants and capturing it and getting it into a form that can then be stored.

Sequestration is the direct storage of CO2, that is, storing activity that you've captured from a power plant or another source. Other sources that emit CO2 are ethanol plants and natural gas reprocessing. So those are some other good examples, but the majority is from power plants.

Sequestration also encompasses enhancing our natural sinks. Things that you can do -- it means like

no-till farming.

We also have a research area called Break-Through Concepts. That's kind of a fun name perhaps, but that's where we put those really high risk research opportunities that have the potential for a big reward.

Those are the revolutionary ideas that offer potential leap-frog improvements, and that's where you get to some of the ideas that are further out like turning CO2 in solid carbonate -- solid carbonate minerals or turning CO2 into something that you can use -- into a useful product, and also in that area of the program we have some other neat technologies for capture that are just risky, and at this time they don't look like a technology that is feasible, but it's too good of an idea to pass up. It's on the back burner.

I've mentioned non-CO2 greenhouse gases this evening in a round-about way. Methane emissions potential, we can't ignore them, and there are many opportunities that we can use that methane that is being released.

Methane that is coming out of landfills and coming out of coal mines, maybe we can do something like add a fuel cell and use that energy on-site instead of letting it get released into the atmosphere.

And finally, Measurement, Monitoring and Verification is a very important part of our priority program

and that permeates to the other areas like capturing and sequestration, and that's measuring the amount of CO2 during storage and after storage. That's monitoring your injection of carbon underground, and monitoring your carbon that is going into the ecosystem. Having that mitigation plan so that if you detect a leak, you are in a position that you can go in and fix it with mitigation technology.

And verifying -- verifying the carbon that you have in storage. Verification in some way that is straightforward.

Another important part of our program is that orange circle. That's our infrastructure. That's our regional partnership. Tonight we have Martha Crebs (ph) and Larry Meyer here representing the West Regional Partnership, which is centered here in California.

We have seven Regional Partnerships -- and I'll talk a little bit more about these in a minute -- but in a nutshell, these partnerships are the baseline of that infrastructure.

If the Carbon Sequestration Program is successful, and we develop all these technologies for carbon sequestration and we're ready to go but we don't have an infrastructure set to deploy them, it will have been for nothing.

If Congress were tomorrow to enact carbon

legislation nationwide instead just a few little pockets in some given states, we wouldn't be prepared. The regional partnerships are starting to do some of the groundwork that is needed. There are right now in Phase I really baselining regional sources and what carbon sequestration options make sense for each region.

And finally -- I'm going to talk a little bit more about the regional partnerships in a minute -- but also the circle on the bottom is Integration, and what that is is that is to really design an energy plan that produces electricity and hydrogen and at a significant scale. We have some field tests going right now but they are all very small.

I promised I'd talk more about the regional partnerships, and I will. This map shows our seven Regional Partnerships. I mentioned the West Partnership on the West Coast. We also have the Big Sky Partnership, which includes Montana and Idaho. We have the Great Plains Regional Partnership, including most of the upper midwest.

The Illinois Basin -- I'm jumping around a little obviously. The Midwest or Midatlantic Partnership representing Ohio, West Virginia, Pennsylvania, that area, as well as Michigan and parts of Kentucky and Indiana. We also have the Southeast Partnership representing almost all of the southeast, and we have also have a Southwest Regional Partnership.

The partnerships all together represent 40 states, 2 Canadian Provinces, 3 Indian Nations and 154 organizations. Very widespread and a lot of great work is going on.

As I mentioned, the Partnerships right now are baselining regional sources and sinks. Another thing that they are doing that I find interesting is they are assessing the Regulatory Environmental Outreach on a regional basis.

Each partnership is looking at the State Regulations and what needs to happen as well as getting in and talking to people of the public in forums, other than these meetings, to find out what people think about carbon sequestration.

They are establishing protocols on a regional basis, and the idea is this first phase will end in the end of next year, and then we'll begin a phase -- potentially depending on future funding -- we would begin a Phase II testing.

Just a few more words about it. The idea is to produce electricity and hydrogen from coal. Hydrogen would be in a form that could be used for transportation vehicles or purely for energy. Producing energy in which there is no pollutants, and ultimately capturing and sequestering methane and CO2.

When the FutureGen Initiative was first announced last year, it originally wasn't going to be a part of the

Sequestration Program. It actually was to become a program in and of itself; however, carbon sequestration technologies are, of course, critical to its success and future, and they are very closely integrated.

I know I presented a lot of information. If you want to know more about carbon sequestration, I encourage you to visit our website.

If you look at the buttons that are on the left, we have a reference shelf, and that reference shelf includes a lot of plot presentations, it includes facts sheets on all of our projects now. I think we are up-to-date now. Information about the regional partnerships. Just about anything that you want to know.

We have a portfolio document that's on there. Basically anything that anybody wants to know about carbon sequestration is available on the website. We also have a kids only area of our website. It includes some fun games, and some really basic information about what carbon sequestration is, what climate change is, and how you get there.

Finally, we send out an e-mail newsletter on carbon sequestration. I encourage you to go to our website and sign up for the newsletter. It's pretty much carbon sequestration that's been in the news in the past month, plus any legislative activity.

That's all I have. Thank you all for being here and for your attention. I'm sorry it took me a few minutes to wake up.

MR. LORENZI: Thank you, Sarah.

We're basically finished with the Department of Energy's part of this meeting. No one has signed up to speak or make any comments or observations either on our Sequestration Program, the concept or idea of sequestering carbon dioxide or the environmental analysis that we are going to prepare; however, you all that are in attendance here tonight, this is your opportunity to grab the microphone and make some comments, observations, things that you believe that the Department of Energy should factor into its future planning, factor into this environmental analysis. This is your chance if anybody wants to make comments.

Okay. Please state your name and spell your last name, and if you're making any observations or comments on behalf of an organization, please indicate who you are affiliated with.

A Doug Wickizer, California Department of Forestry, Fire Protection, W-I-C-K-I-Z-E-R. It's a question.

Could you just review the timelines and availability of the environmental documents, please?

MR. LORENZI: We expect that a draft -- okay. The closing day for comment is June 25th of this year. A draft

of the Environmental Impact Statement should be available next summer. It will be about 12 months from now before a draft will be made public. That draft will be issued and made available, distributed. We will have public meetings again on that draft document.

Following that -- following those public meetings, we will proceed to prepare a final EIS, Environmental Impact Statement, and that could be up to 12 months.

MR. WICKIZER: Are you far enough along to have any draft alternatives that you would be considering for use in those documents?

MR. LORENZI: The only alternatives that have been identified are the ones that were announced in the Notice of Intent to prepare the draft EIS, okay.

If you pick up information outside, it does have that Notice of Intent in the package of information. Those are the alternatives currently.

MR. WICKIZER: I just wondered if you are proposing any additional ideas that were useful at this time.

MR. LORENZI: We will formulate additional ideas by the end of the scoping period on the 25th. I can't say anything additional right now.

MR. WICKIZER: Okay. All right. Thank you.

MR. LORENZI: Anyone else?

The Department of Energy goes through a lot of

effort for these kinds of meetings. The turn out at some of these meetings have been, let's say, less than desired, less than anticipated, and less than heartwarming.

If there are any ideas that you all have that could factor into planning for the next public meeting that will occur maybe sometime next summer on the draft EIS, please consider providing feedback in that area as well as any other feedback that you would anticipate or not anticipate or that could be provided on this effort. So just a side note.

If no one else wants to speak, then we will proceed to close the meeting. I want to remind everyone that the closing date for comments is June 25th.

This is a unique opportunity to get your voices heard about how your taxpayer dollars are spent on this program, and these opportunities don't come along often, but when they do, we certainly want to be responsive to the public, and so if you have any comments.

MR. KREVOR: Sam Krevor, not representing any organization, K-R-E-V, as in Victor, O-R. Just in response to that last comment about getting people involved, I'm actually not quite sure how the notifications have gone out.

I would highly encourage sending e-mail notices to administrators at universities especially in the area where the meetings are going to take place and encourage them to have, you know, their professors and students to attend the

meetings. I think they would be interested.

MR. LORENZI: Thank you for that comment.

Any other inputs on that topic or any topic related to this EIS?

Again, please, submit them by June 25th. Take some comment sheets or some information out front that has some information in there on how you can submit comments, be they written, e-mail, telephone, fax, and also there is information on how you can follow the progress of this effort to prepare the draft EIS.

With that final comment by me, we can call the meeting to a close. I wish you all safe travel back home. Thank you all for participating, those who did participate, and it's about 7:34 p.m. The meeting is officially closed. Thanks again.

(Meeting ended at 7:34 p.m.)

REPORTER'S CERTIFICATION OF TRANSCRIPT

I certify that the above named witness in the foregoing deposition, was by me duly sworn to testify the truth, the whole truth, and nothing but the truth, in the within-entitled cause; that said deposition was taken at the time and place therein named, and that the testimony of said witness was reported by me, a person, and was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for either or any of the parties to said deposition, nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I hereunto set my hand this 28th day of June, 2004.

Nicki L. Fukuman, CSR 12492